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AUTHOR Wenger, Gary E.; Lemme, Ronald
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ABSTRACT

The College of DuPage (CD), a community college enrolling 28,890 students and employing 2,400 faculty, staff, and part-time student employees, decided to develop a plan for computing in order to inventory computing resources on campus; justify resources based on current capacities and limitations; identify opportunities for effective resource management; identify potential hardware and software problems; establish a unified approach for goal setting; set priorities; allow for more effective responses to technological changes; and provide a strategic direction to meet the current and future needs of the institution. The development of the institutional plan involved 18 steps, including the following: obtain executive management support and commitment, set up a team to be responsible for the planning effort, involve all levels of management, identify a planning process, conduct surveys to gather input, use reference material to formulate comparative data, review historical information on computer usage, set up active committees, review current and future technologies, and define financial considerations. This report on the planning process includes an overview of the resulting institutional plan for computing, including brief descriptions of the plan's chapters on the planning process, the current environment, academic computing, administrative computing, central computing, and summary recommendations and financial considerations. (UCM)

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DEVELOPING AN INSTITUTIONAL PLAN FOR COMPUTING

by

Mr. Gary E. Wenger

Dr. Ronald Lemme

College of DuPage
22nd and Lambert Rd.
Glen Ellyn, Illinois

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Developing an Institutional Plan for Computing

**Mr. Gary E. Wenger
Dr. Ronald Lemme**

**College of DuPage
22nd and Lambert Road
Glen Ellyn, Illinois 60137**

The College of DuPage is a community college with a student enrollment of 28,890 students and about 2,400 faculty, staff and part-time students employees. There are many issues today and in the future that will affect higher education. New technologies will have a tremendous impact on how we teach, manage and administer an educational institution. We feel planning for computing provided the institution an organized approach to meeting the challenges of today and the future. This paper is divided into the following sections.

- **Why Plan for Computing**

This section discusses the major reasons why the College of DuPage decided to plan for computing.

- **How to Plan for Computing**

This section discusses the steps that were important in planning at the college.

- **A Model of an Institutional Plan for Computing**

This section reviews the organizational structure of the College of DuPage 'Institutional Plan for Computing'.

Why Plan for Computing

The first step of a planning process is to determine the need to plan for computing. Planning requires a significant resource commitment from an institution. There were ten key reasons why the College of DuPage decided to plan for computing.

- **Provides an understanding of computing on campus**

We used the planning effort to define the computing resources; hardware, software and support. This provided a basic inventory of all computing resources. In order to share resources, we needed to know what was available on campus.

- **Provides justification for resources**

In reviewing the existing resources for hardware, software and support and projecting future needs based on new requirements provided additional justification for resources based on current capacity and limitations.

- **Identifies opportunities for effective resource management**

By evaluating existing equipment on campus provided possible resource sharing, centralized support and reduced maintenance on current equipment and replacement equipment.

- **Identifies threats in the current environment**

By evaluating existing hardware and software, possible problems were averted.

- **Provides unified approach for goal setting**

The institution sets individual goals that are supported by all departments.

- **Provides institutional commitment to shared objectives**

When everyone is involved in the planning process, they tend to work together to meet objectives.

- **Set priorities and timeframes for computing in the relationship to other institutional goals**

Computing is not the only goal for the institution. By planning for computing you set the appropriate priorities in relationship to other goals.

- **Allows more effective responses to technological changes with the institution**

Once the strategic direction is determined decisions affecting technology can be made effectively.

- **Provides cost analysis and control of spending levels**

By effective planning for computing for three years identifies costs and upper limits. In the past it seemed we were providing funds without knowing what next month or next year would bring.

- **Provide a strategic direction to meet the current and future needs of the institution**

If you have directions your decision making is easier. By planning properly each year you stay on course to hopefully make the right decisions or more so than not planning.

How to Plan for Computing

Planning of computing is not a simple undertaking. It requires a significant commitment in resources from the president to the end users. We feel there are 18 key steps to developing a successful institutional plan for computing.

- **Obtain executive management support and commitment**

The most important issue is commitment and support from executive management of the institution.

- **Setup a team to be responsible for the planning effort**

Must have a group of responsible people to provide the majority of the work effort.

- **Involve all levels of management**

Managers, Directors, Vice Presidents and the President were involved in the process. This provided open lines of communication throughout the institution.

- **Identify a planning process**

You must identify the steps in the planning process to know what has been done and what needs to be done throughout the project.

- **Setup surveys to gather input**

Surveying is a good method of collecting input on many issues. We found that the best survey was a personal interview with each of the departments.

- **Use reference material to formulate comparative data**

It is important to compare where you are as compared to other institutions of similar size. Whether you are spending at similar levels or the PC to student ratio can provide some justification. Do not use comparative data as your only justification.

- **Review historical information on current computer usage**

In order to know where you are going you need to know where you have been. We needed to gather enough historical data to project usage or capacities on the existing equipment.

- **Setup institutional committees**

You need to setup representation from the academic and administrative areas of the institution. The plan must come from the users department not just Computing.

- **Define goals and objectives for each committee**

The committees should define a set of goals and objectives in order to identify responsibility.

- **Provide constant feedback to all committees**

It is important to keep all committee members informed on the progress. Minutes should be taken and reviewed for each meeting.

- **Committees must meet on a regular basis**

Setup a regular schedule of meetings. The frequency will vary depending on where you are in the planning cycle. You should meet at least once per month.

- **Committees must have 'active' members**

Appoint committee members that will participate in the process. The committee members must be willing to work outside the meeting and attend all meetings.

- **Provide adequate time for planning**

Depending on the complexity of your environment and the scope of the plan, you must provide adequate time for planning. This can take 12-24 months.

- **Limit plan to three years**

We limited our plan to three years with revisions each year. We felt that planning for any additional years would be a waste of time.

- **Develop an outline for the plan**

Work with the committees to determine what should be included in the plan. Setup a preliminary outline in the beginning. Change the outline as needed throughout the planning process.

- **Review current and future technology**

You must review the current and future technology in order to compare with what you have and recommend improvements.

- **Define recommendation & action plans**

Define a set of recommendations for each major area of computing and define the dates for implementation for each recommendation showing the acquisition, installation and production for hardware, software, and support.

- **Define financial considerations**

The plan should include the cost for each recommendation and if possible, identify funding options and provide a financial plan. We included a unit cost analysis showing the effect of the plan each year on the student cost.

Model of an Institutional Plan for Planning

This section provides an overview of the organizational structure of the College of DuPage's 'Institutional Plan for Computing'. The report was setup to provide an organized and easy to read document for the board of trustees, management and users. The document was prepared using type set quality printing incorporating the use of graphics and tables to improve the presentation.

The plan was divided into seven major chapters; Introduction, The Planning Process, The Current Environment, Academic Computing, Administrative Computing, Central Computing, and Summary Recommendations and Financial Considerations.

Each chapter of the plan contained a section called 'action plans and financial considerations'. This section provided the estimated budgets for capital and operating costs for each item recommended in that chapter. Also included was a timeframe for purchasing the items. The timeframe was divided into acquisition, installation and production. Acquisition was the month for purchase, installation was the estimated installation of the equipment and production was when the user could use the equipment.

Introduction

'Introduction' chapter described the major issues and trends that will impact computing in higher education in the future and provided the justification for planning. A few of the major issues included declining cost of computer hardware, increased demand for computer-related education, software development, staffing and communications.

The Planning Process

'The Planning Process' chapter described the planning process in detail including surveys and committee structures and the flow of planning information and decision making. This chapter of the plan was divided into 'surveys' and 'committees' sections.

Surveys

After designing literally hundreds of questions to solicit the most complete and meaningful data possible, we generated five surveys: the Academic Computing Survey, the Administrative Users Survey, the Administrative Computing Departmental Survey, the Academic Computing Departmental Survey, and the Community College Survey. Each survey was designed to gather the ap-

propriate information from a group of users. We found the departmental survey provided the best information for planning. In the departmental survey we interviewed each dean and director.

Committees

We setup five committees on campus to be responsible for the different levels of planning.

Academic Divisional Computer Committee - ADCC

Each academic division identified three to five faculty members involved in computing. These members served on the Academic Divisional Computer Committee to address computing needs. Their responsibility was to:

- Define long range computing objectives
- Define the importance of the computing objectives to the instructional process
- Collect information from the division and incorporate the information into a computing plan for the division
- Provide a divisional plan to the **ACPC** committee which identified anticipated and projected new computer use and direction for computing at the divisional level

Academic Computer Planning Committee - ACPC

The Academic Computing Planning Committee consisted of faculty representatives of each academic division, two academic deans and the Manager of Academic Computing. The charge of the committee was to gather and evaluate information as provided by the Divisional Committee and Computing and Information and use this information to:

- Define the current computing environment
- Evaluate computer resources and support
- Make suggestions on how to improve computing
- Define academic computing needs and objectives for the college
- Review of ongoing divisional computing needs

Administrative Review Committee - ARC

The Administrative Review Committee consisted of Deans and the Executive Director Computing and Information. This committee reviewed the information provided by the ACPC and provided a higher level review of the proposal. The committee was responsible for:

- Reviewing the divisional needs
- Providing additional input on divisional needs
- Recommending a priority of the needs
- Reviewing goals and objectives

Administrative Systems Users Advisory Committee - ASUAC

The Administrative Systems Users Advisory Committee consisted of major computer users and director/dean level representatives from the five administrative units (Main Campus, Open Campus, Administrative Affairs, External Affairs, and Planning and Information) as well as the Executive Director, Manager Administrative Systems, and Manager Information Support Services from Computing and Information. The committee was responsible for:

- Reviewing and prioritizing all administrative programming requests
- Providing input from their units on computing needs for hardware, software and support
- Providing input on future computing needs
- Formulating the Administrative Computing Plan
- Evaluating the Administrative Computing Plan
- Reviewing ongoing unit needs

Computer Services Management Committee - CSMC

The Computer Services Management Committee consisted of the President, Vice President Planning and Information, Vice President Administrative Affairs, Vice President External Affairs, Provost Main Campus, Provost Open Campus, and the Executive Director Computing and Information. The committee was responsible for:

- Reviewing the academic planning recommendations
- Reviewing the administrative planning recommendations
- Reviewing the future direction recommendation
- Recommending priorities
- Recommending funding levels to the Board of Trustees

Final funding decisions for the Institutional Plan for Computing was made by the Board of Trustees during its review.

Current Environment

'Current Environment' chapter described the current computer facilities in terms of computing support, hardware and software. The chapter was divided into two sections, Computer Support and Computer Systems and Facilities.

The computer support section identified all the departments providing computing support with respect to personnel. The amount of support was defined in FTE's, full-time equivalents and the type of support i.e., programming, consulting and training.

The computer systems and facilities was divided into five areas: mainframe system resources, minicomputer system resources, office automation resources, microcomputing resources, and academic computing lab facilities. Mainframe, mini and office automation resources were subdivided into descriptions for the major workload, system hardware, system software and application software. 'Microcomputing resources' was subdivided into administrative and faculty resources. The 'academic computing labs' was subdivided into hardware in the lab, description/purpose of lab, management and staffing.

Academic Computing

Academic Computing included all of those activities which were integral to or related to student instruction in computer-related disciplines, or other instruction which relied on computers. This included all computing functions which either assisted instructors in the development or maintenance of course materials or facilitated students in the learning process. Academic Computing involved all of those activities which support the use of computers such as the maintenance of hardware, the integration of software into instructions, the preparation of support materials, personal consulting or problem solving and the management of lab facilities. Academic Computing also involved those activities which promoted the growth in the use of computers such as the consideration, selection, and review of hardware and software; training for computer literacy; computer planning and the development of new academic applications.

The Academic Computing chapter was divided into 'Student Usage', 'Hardware Needs', 'Software Needs', 'Support Needs' and 'Action Plans and Financial Considerations' sections.

An Academic Computing Departmental Survey provided information which allowed for projections of computing needs over the next three years and also how hardware and software resources should grow to support those needs. We provided a brief description of the major instructional divisions for Main and Open Campus, and the level of computer usage for these areas.

Growth projections were presented in terms of the number of additional students and contact hours, as well as a written description of those areas where growth is expected to occur. This included a description of new applications or systems that may be used over the next three years.

Projections in the number of additional computer stations were determined for the college as a whole for each type of computer resource.

Faculty access to computer resources was evaluated and compared to the number of computers which are needed over the next three years. The Academic Computing Departmental Survey provided information on the current amount of money budgeted for software by each area of the college and the projected percentage increase which is needed over the next three years. The Academic Computing Survey provided a description of the applications which are needed.

Student computer support was also evaluated by determining the current level of support in terms of FTE support staff per number of computer users and then projecting how support should increase over the next three years to maintain the current level of support. The current level of faculty computer support was also determined and the importance of various types of support was evaluated. A comparison will also be made between the number of support staff available to students and faculty at the College of DuPage and the other community colleges which were surveyed.

Administrative Computing

Administrative computing included all the information processing services which provide the college management with the data necessary to make decisions, record data, and carry out the day-to-day operations. The major administrative functions/applications included payroll, personnel, general ledger, accounts payable, accounts receivable, purchasing, student registration and records, financial aid, inventory, word processing, and management information system.

Several issues pertaining to administrative computing was addressed to provide an acceptable level of service and support:

- Provide users adequate online response time, i.e. quick access to data
- Provide users with adequate disk space to store their data now and for the future
- Provide users with a security system to maintain the integrity of the data
- Provide users applications that are flexible and easy to maintain and modify
- Provide users applications that are accurate
- Provide users the tools to access their data and generate their own reports and analysis
- Provide users consulting support for their applications
- Provide users with training on how to use an application
- Provide users with user documentation for ease of use
- Provide users with flexible operational hours
- Provide technical expertise to evaluate current and future applications

Administrative computing was divided into 'software', 'hardware' and 'support' needs. Software included major administrative applications and end user applications. All major administrative applications were supported by Computer and Information and were usually run on a mainframe or minicomputer. The end user applications dealt with "tools" that were used by end users to perform their jobs. This would include microcomputer-based applications and decision support systems.

Software Needs

Administrative Software Needs

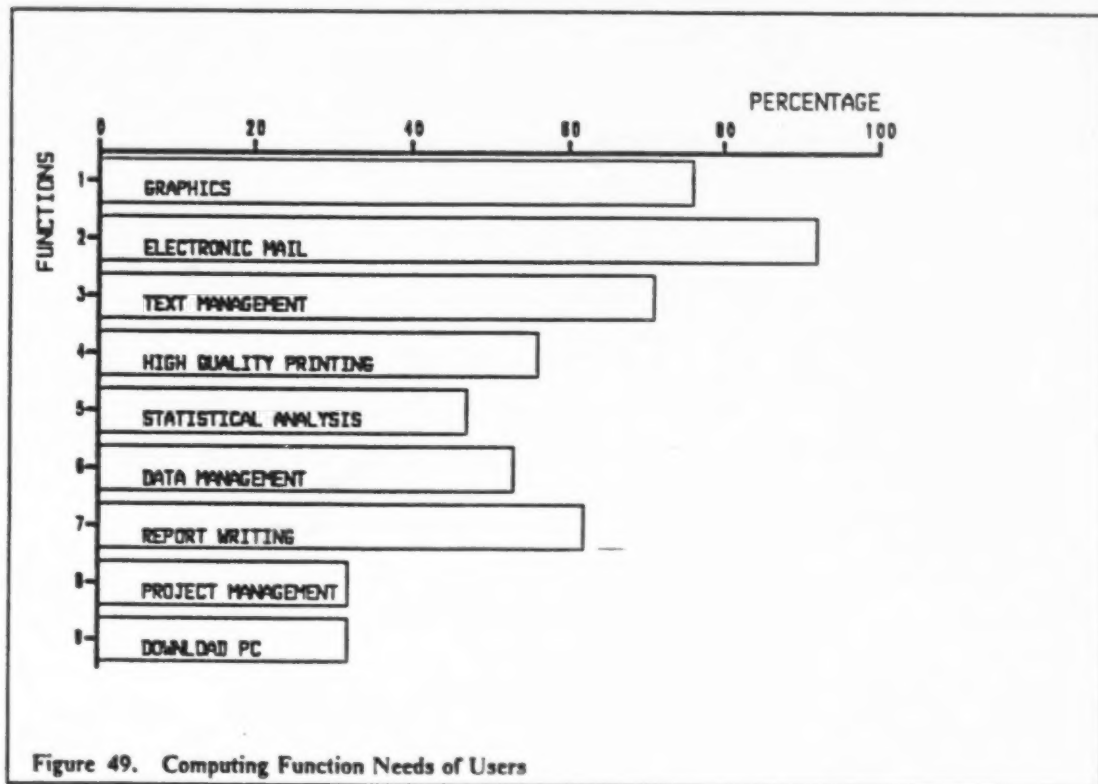
The major administrative software applications at the college included: General Ledger System, Human Resources System, Financial Aid System, Student Billing and Receivables System, Student Records System, Capital Assets System, Management Information System, CLSI Library System, Response System Variable Prescription, Office Automation

For each major application we provided a 'description' of the application, who were the 'users', 'current problems and concerns', 'growth estimates' and made 'general recommendations' for the system.

End User Software

End user software consisted of any application that existed on user personnel computers or on fourth generation applications on the mainframe. We surveyed the user departments to identify the computing functions that were needed. The functions were divided into nine categories: graphics, electronic mail, text management, high quality printing, statistical analysis, data management, report writing, project management and download PC.

Below shows a graph of the computing function needs of users. This is an example of how we used graphics in the plan.



Support Needs

Computing support was divided into four areas: training, programming, documentation and consulting. We surveyed the user departments to determine the major support area.

Computer support is provided by several areas of the college. In the departmental survey we requested users identify areas of support that needed improvement. The following figure shows the individual departmental support needs. This is another example of the tables we included in the plan

DEPARTMENTAL SUPPORT AREA NEEDS				
DEPARTMENTS	1	SUPPORT AREAS*		
		2	3	4
PRESIDENTS				
Office of President	X			
Auditor	X			
MAIN CAMPUS				
Office of Provost	X			
Automated Office	X			
Instruction			X	X
Humanities & Liberal Arts		X		X
Social & Behavioral Sciences				
Natural Sciences				
Occupational & Vocational Education	X			
Business & Services	X			
Student Affairs	X	X	X	X
Learning Resource Center				
OPEN CAMPUS				
Office of Provost	X			
Academic Alternatives	X			
Business & Professional Institute				
Regional Center - Southwest				
Regional Center - East	X			
Regional Center - North	X			
Community Education	X			
ADMINISTRATIVE AFFAIRS				
Office of Vice President	X			
Campus Services	X	X		X
Auxiliary Enterprises	X	X		X
Financial Affairs	X	X	X	X
Human Resources	X	X		X
Purchasing	X		X	
Public Safety				
PLANNING & INFORMATION				
Office of Vice President	X			
Computing and Information				
Admissions, Registration & Records	X		X	X
Research & Planning	X	X	X	X
EXTERNAL AFFAIRS				
Office of Vice President	X			
Public Information/Media Production	X	X	X	X
Development	X			
Campus & Community Events	X			
*1-Training		2-Programming	3-Documentation	4-Consulting

Figure 1. Departmental Support Area Needs

Hardware Needs

In the hardware needs section within Administrative Computing we included all departmental personal computers, terminals and printers. This need was defined by each department requiring access to the mainframe and departmental applications. Although the equipment was included in the plan, each department had to budget/fund the equipment from their own budgets. This provided flexibility within each department to set their own priority.

Central Computing

Central Computing was all the support in system hardware, software and personnel that was shared with academic and administrative computing. This included governance issues, computer operations, system hardware, software and support and campus-wide communications. This section

evaluated the central computing concerns and recommended a direction in each area that would meet our current and future needs.

Governance

We reviewed the governing authority of the organization in dealing with computing on campus and recommended changes that would improve planning and the operation.

System Software Needs

Systems software are the program/applications that support the operation of the central computing facility. This included a review and appropriate recommendations for operating system software, security, performance monitoring, system accounting and charge back, and data center management software.

Support Needs

We reviewed the support needs for systems and operations. Recommendations were based on current and future acquisition of application and system software. Data base and security were key areas for support.

System Hardware Needs

Computer equipment needs were based on the growth of existing applications and new applications that are to be purchased or developed. In situations where the growth exceeds the capacity and the capacity cannot be expanded, the equipment must be replaced. If the equipment cannot perform a certain necessary function, even with upgrading, then the equipment must be replaced. In the following sections we identified the hardware component needs for the next three years.

Computer equipment needs on the IBM system were defined by four major areas: 'disk space', 'ports', 'CPU memory', and 'CPU power in MIPS'.

Disk Space

The disk space was defined by the current application usage including administrative, academic, and systems; the estimated growth from 1988 to 1990; and the new applications that are planned over the next three years.

We provided tables with current and new application disk space requirements. The disk space requirements were projected for the next three years. A graph in the plan showed the disk space used vs. available and projected the growth through 1990.

The disk space was defined by administrative software applications and system software applications. The administrative software application disk space included storage for all the data files, work areas, and programs that support the application. The system software applications included disk space that was required for operation of the computer systems software.

The same approach was used for 'ports', 'CPU memory' and MIP capacity. Graphs were included in the plan showing trends. Recommendations were made based on the current and future application needs.

Communications and Networking

We reviewed the communications and networking needs on campus. We discussed the problems with incompatibility of computer systems. The users were surveyed on connectivity needs and a table was included on which systems needed to talk to other systems. Several strategic directions were defined for communications and networking along with a recommendation to develop a plan for telecommunication on campus addressing voice, video and data.

Summary Recommendations

This chapter provided summary recommendations and financial considerations for academic, administrative, and central computing for fiscal years 1988-1990. Included are sections summarizing the staffing needs, the total institutional financial considerations with various funding alternatives.

Academic Computing

This section summarized all the recommendations for Academic Computing. The recommendations were divided into hardware, software, support for faculty and students. A financial table was included showing the cost by fiscal year for operating and capital costs.

Administrative Computing and Central Computing

Administrative Computing and Central Computing sections were defined using the same approach as the academic computing section on recommendations and financial considerations.

Support

We summarized in one table all the staffing needs for the next three years. Each new position requested was identified including a summary justification for each.

Institutional Financial Considerations

This section was divided into a summary of cost for administrative, academic and central computing by fiscal year. We included sections on funding alternatives and a financial plan. The financial plan showed tables on actual vs. estimated budget for FY84-FY88. We provided several funding options including financing and setting up a general computing lab fee. The last part of this section included a unit cost analysis of actual vs. projected assuming the plan was funded.